SECRET

in AS-3 File (RD-122)

(ATTACHMENT "A"

Defects in AS-3 Prototype

1. [redacted] 25X1

(INC)

a. The mechanical construction of the coder is poor.
b. The action of the key linkages is not positive.
c. The close spacing of the coder keys makes it easy for the operator to inadvertently code the wrong character. ILLEGIB
d. Tests indicate that the spacing of the START and STOP pulses is not consistent. The coder should be redesigned to provide a positive acting, rugged unit, capable of withstanding the normal rough handling of field use.

2. CA-3 Cartridge

a. The nylon insulating tip of the erase plunger fell off, and the plunger was not properly aligned with the hole through which the erase circuit switch is activated. These defects caused complete failure of the erase function.
b. The cartridge reel gear failed to mesh properly with the keyer drive, resulting in erratic speed and jamming.
c. The cartridge would not operate with its cover on.
d. The cartridge does not fit into key slot. The cartridge is not marked with AS-3 identification symbols. The magnetic tape cartridge should be modified to seat more securely in the keying slot, and the cartridge keyers should align precisely with the keyer drive keyer.

3. AP-3 Power Supply

a. The heat sink for the 2N173 current regulating transistor is inadequate; its dissipation ~~capacity~~ faster should be increased. Slight temperature rises due to overload or prolonged operation cause failure of the current regulating transistors, despite the use of a cooling fan. For this reason, it was impossible to conduct high temperature tests on this prototype.
b. The over voltage relay failed to operate properly. The relay should be adjusted to open when the line switch tap is switched to the next lower voltage.
c. There is no short circuit protection on the power supply. Since a number of conditions encountered in the field can cause momentary short circuits it is essential that field equipment be able to recover from them.

4. AT-3 Transmitter

a. The keyer motor speed is too high and should be reduced to provide the tape speed recommended in the specifications.

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b. The transmitter failed to operate at -40°F (cold start), due to frost which collected on the components. When the key was depressed, the B+ line shorted out and destroyed the IN535 rectifier in the DC to DC converter. It is recommended that the transmitter be sealed when ventilation permits, to reduce moisture collection in the equipment.

not done c. The radiated key-click interference is most pronounced in the 150 to 300 kc range. This radiation should be reduced by appropriate filtering of the key line.

d. The observed keyed waveform of the transmitter shows that the pulse trace has sharp trailing edges. This waveform should be shaped to reduce high order harmonic radiation.

e. The DC to DC converter section of the transmitter failed to operate on two occasions during the tests. The operating parameters of the IN535 rectifiers should be investigated to determine the effect of temperature on maximum rectifier output current.

f. The interconnecting plug between the AT-3 power supply and the transmitter does not fit securely. This connection should be securely keyed to prevent accidentally disconnecting the transmitter from the power source.

g. Some components used in the AS-3 are nutrient to fungus growth. These components should be sprayed with an adequate fungi-resistant compound.

h. The hand key furnished with the transmitter failed to operate and should be replaced.

i. A resistor in the antenna meter circuit, which was marked 390 ohms on the schematic, failed due to overheating.

j. The antenna tuning meter pegged in both the A and B positions when using resistive antenna loads of 600 and 1300 ohms. The values of the resistor elements in the antenna meter circuit should be adjusted to provide correct meter indication with high antenna impedance. It is suggested that the feasibility of measuring antenna current for low impedance loads and antenna voltage for high impedance loads be low impedance loads and antenna voltage for high impedance loads be investigated.

k. The tuning shaft of the final tank coil became loose in the coil form and prevented tuning of the final tank circuit. The replacement coil assembly supplied by the manufacturer operated properly.

l. The threaded inserts which are riveted through the chassis and hold the cover screws were not properly secured.

m. The glass used in transmitter and power supply meters should be replaced with plexiglass to reduce the likelihood of breakage. It is recommended that different colored buttons be used for recognition, message, and battery voltage functions.

n. It is difficult to preset the tuning coils by lining up the coil roller with the marks on the calibrated windows. It is suggested that a more easily visible method, such as a plastic pointer be used to allow even an untrained operator to quickly set up the frequency.

4. Because of the excessive weight of the power supply, it is recommended that a recessed handle be placed above the center of gravity to simplify transportation. A similar handle on the transmitter would be useful, although it is not absolutely necessary.